

A
LITTLE LIBRARY

For all that are Studious in the
great ART of

Navigation:

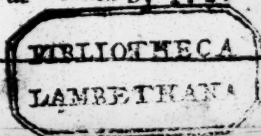
Built and furnished,
By JOHN SKAY, Mathematician,
Philosopher, and Notary-
publique.

*Mathematica Doctrina conducit ad reliquas Artes;
maximè enim preparat viam ad Theologiam, Phisicò
conducit, plurimum prodest moribus: Ptol.
Mathematices omnes Disciplinas
complectitur.*

23 Decemb. 1646. Imprimatur JOHN BOOKER.



Printed at London by T. F. 1647.





The Epistle Dedicatorie.

moist quality, the Airy Sanguine humour; Or too much fluxed with a cold and moist quality. The watry white Phlegmaticke humour: or all fired with a hot dry quality the yellow chollerique humor: By these few rules and lessons rightly used and well applied; the Malignity will bee taken away, and by reason the extremities in those qualities and humors shall be healed; the inordinate passions with the sensuall faculties subdued corrected governed; and the affections that stand between reason in the mind, and sensuality, will be well ordered and settled: which by understanding judgement and the other faculties of the mind are brought to be serviceable to the Soule who is Lord Paramount in Microcosmus: she will teach us to be like her selfe, rationall and spiritually minded, and by reason, to expell vice, love and embrace divine vertue and heavenly Grace.

These things are briefly shadowed forth in the seaven Books within this little Library purposely applyed by me unto Navigation and Seafaring men; If your memories may remaine in this Epistle, you will ever deserve most worthy thanks of all that receive profit by it: the labour is mine, and not without some cost, and those that desire it must labour in it, serve God and use the meanes, if ever they will worthily apprehend it. Fare you well, and rest ever vertuous, gracious, happy; and as you are, have, and shall be each one a good Lord in your turne; so no doubt but you will all meet me, and be dust in your Grave: We that are sinners must die, and after death wee shall meet together and come to judgement. Till then, none can be judged happy: yet it is accounted some degree of happinesse, to bee in the way of happinesse, but more happy in chosing the better part, which shall not be taken from us if we persevere therein to the end. Therefore most happy of all, and blessed are the dead that die in the Lord: The reason why? For they rest from their labours. What labour I pray you doe the great men of the World? They subdue sinne that it Reigne not in their mortall bodies.

The Tree of sinne is a Sea-plant growing in Mare-Asphaltum: the root is Originall, the trunke sensuall, the sap diabolically; and the sinde worldly vanities: it hath abundance of branches, buds, leaves, flowers, and fruits: but wee shall be delivered from this body of sinne wretched men as we are: *Vt quemadmodum regnaverat peccatum ad mortem, ita etiam gratia regnaret per justitiam ad vitam eternam per Iesum Christum Dominum nostrum.*

THE
Sea-mans Alphabet,

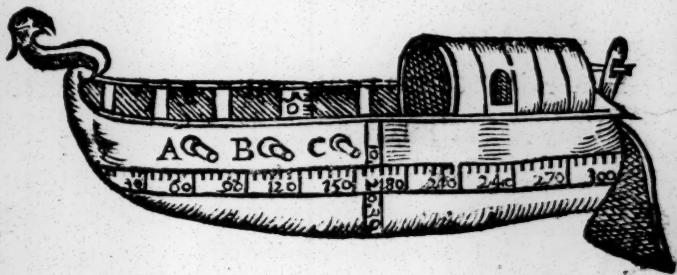
By,
F. S. M^r. in the Arts

Legendi Scribendi Calculandi ac Mathematicorum.

*Mathematicæ ex vi verbi omnia MATHMATATA id
est Disciplinas Complectitur. Sav. præf. 2.*

O Deus!

Posuisti in mari viam, & in fluctibus socurum Callem. Sap.



Printed at London, by Richard Cotes. 1645.



To the Reader.

BEloved this Pamphlet
was published for a helpe
to our young Marinors,
and to teach them in a
Rationall way, their owne
As in part; by the helpe of right Reason:
if it profit them, the Author hath his de-
sire, if not, the fault may be in the Patient,
and not in the Agent. But if it prove
nought, let him that licensed it, cause it to be
burnt, and there's an end.



THE Sea-mans Alphabet.

To my joviall young Seamen, who (not knowing enough) may here learne more, if they be but willing to do themselves good.

Nginous Youths ! be not too witty, to bee wise indeed: be not to forward, nor froward; are ye voyd of Reason? You know, for as much as Almighty God hath given unto man a living Soule, and hath endowed him with Reason above all other Creatures: Therefore they doe not onely fly things hurtfull, Seekeing that which is good necessary and profitable to the body, as other Creatures doe: but also they prosecute their matter unto a good degree of perfection, though they have no learning at all; by help of their Mother Witt and naturall Reason onely.

Yet when there is adjoyned the knowledge and use of good Letters, So as we can but Reade and Write, surely one of our Eyes will be well opened; especially if also wee

learne to Number and Measure well: for then wee shall see more Cunningly how to handle and Mannage our affaires both by Sense and Reason, as common experience proveth.

But unto these you must add also, the knowledge and uses of this your ensuing Alphabet (of Words) for thereby certainly both your Eyes will be opened, both of Reason and understanding: to see clearly, and obtaine the knowledge of all matters, and of all things.

The Alphabet.

1 **G**enus, Species, Difference, Propertie, Accidens: Substance, Quantity, Quality, Relation, Action, Passion, *Ubi, Quando, Situs, Habitus.*

To know this Alphabet.

The first 5. are certaine degrees of words, and are as the vowels among the Letters, being the most common in their uses. The other 10. words are most generall, as the Consonants.

And as diligently as children and young Schollers learn their letters and parts of speech, so ought all young Mariners and Seamen (that hope here after to bee good Commanders, and to serve their Country truely) to learne all these 15 words by heart, if they meane to bee guided by Reason.

To spell Reason.

2 Take the first Consonant, Substance, and set it before the foure first vowels thus. Substance with it's Genus, Species, Difference, Property. Take also the last Vowel, Accedens, and put it before the other nine Consonants, thus. Accidens in Quantity, Quality, Relation, Action, Passion,

Alphabet.

Passion, *Ubi*, *Quando*, *Situs*, *Habitus*; and so we may learne to know, a Substance, from the Accedents.

For the former 5, in this Order are Substances, or in the Substance, as every Substance hath it's Genus that is the generall kind; and is the species, or speciall kind, which hath evermore a difference and property.

But the Accidents are things chanceing and cleaveing to Substances, they cannot be without a Substance where unto they sticke, but yet they are not substances.

An order of Substances.

3 Substances are either without a body, as God and his heavenly Angels, Spirits, and the soules of men, also lines, and superficies; vertues, vices, and affections of the mind.

With bodies, simple and pure, as the visible heavens, with the fixed Starrs & Planets, also the foure Elements: or

Unperfectly mixt as the Meteors dry and moyst: or perfectly mixt without life as Stones, Minerals and Mettles, with Liquors.

Vegetables, as Rootes, grasse, plants, and Trees: and animales, having fence and motion, as, Wormes, Beasts, Fish, Foule, and all living creatures being voyd of Reason.

Also the rational creatures, as the whole race of Mankind.

Order of Accidents.

4 It is by Accident that any thing is in Quantity great or little; by Quality good or bad; by Relation wee learne to who, or what, anything belongeth; Action is the doing; Passion is the suffering; *Ubi* where; *Quando* when; *Situs* the manner; and *Habitus* the forme.

God onely is not subject to Accidents, but all creatures are subject unto the Accidents. And these⁴ are the first Store-houses for mans memory, wherein hee may at all times find meanes to define any thing, and to deuide it into the most convenient parts, and out of these places other are invented, found and produced, thus.

Storehouses of invention.

1. In the Substance, the Definition, the generall Word, the Kiade, the Property, the Whole, the Parts, the Yoaked word.

2. Incident to Substances are the words adjoynd; the manner of doing : the thing contained.

3. Of Affinity are the Causes; efficient, Materiall, Formall, Finall; the End.

4 The Events; as the Effect; the thing appoiated for some end.

5. Application, unto Time, Place, things Annexed.

6. Accident: as things Chancing, Sentences of the Wise; the Name; things Compared; things Like.

7. Repugnants are things Differing, Discordants, Contraries.

Men differed little from beasts, if they could doe no more but Distinguish Words and knew not how to apply them to good uses, nor is every speech to be allowed, but onely such Sentances, as doe shew with apt brevity: the Manners and Common practises of Men; what ought to be and what ought not. Therefore these seven are the second Store-houses for Mans Memory wherein we may at pleasure invent good matters plentifull, and with greate ease.

Not that you shall neede at every turne, all these: but
take

take what you find most necessary; as well in the former fifteen, as in these seven heads of places; leaving the rest after examination which are fittest for your godly purpose.

For there are very many things that ought not to be Reasoned of: As of late some hatie done, both against God and his Word, and Sacraments, and against Religion, and government.

But every matter that is Lawfull, Godly; pleasant, profitable, and honest; may right well be Reasoned of; and that by putting it to the question, thus. First, whether it be or no? Secondly, What it is? Thirdly, What are the parts? Fourthly, the Causes? Fifthly, the Effects? Sixthly, What is next adjoynd? Seventhly, What Examples? and eighthly, What Contraries.

All these things hitherto you may privately learne and dilligently practise applying two or three as in these following Examples: *a little Christ his love a good nature.*

To read Reason.

What is Vertue? It is right reason. Therefore also

Answer, from the seventh Store-houle of Invention which hath the places of Repugnants; and say

Vertue is the Contrary to vice, So the vices of Malice and hatred are Contrary to the Divine Vertue of Love and Charity: but the hatred of evill is a singular vertue.

What parts hath Vertue?

All Morall vertue is Comprehended under these foure heads; Prudence, Justice, Fortitude, and Temperance.

To what effect are these?

Every malignant Vice is presently casheerd, and cleane put

put away, by bringing in it's repugnant, that is, by the present practise of the contrary Vertue.

For what end?

Prudence hath respect to all our worldly affaires; Justice hath care of all persons: Fortitude and Temperance have regard unto all Accidents that happen in the whole course of our lives: Therefore they are singular Rules, to guide our Lives.

Is there such a thing as men call Navigation?

Answer from Genus, that the abundance of Shipping, and the great Traffique by Sea doe manifest it.

What is Navigation?

Answer first from the materiall cause, and from Quallity, and say; Navigation is an Art and Science, composed of many Arts and Sciences: teaching by infallible Rules, how to governe and direct: (then from species, Difference, place and Time; say) a Shipp; from one port to a nother; safely, rightly, and in the shortest time.

What are the parts?

Answer from the whole, and say: Navigation which teacheth us to sayle by Rumbe, and distance; by longitude and Latituds; is Divided into two principall parts; First, the Theorique, Secondly the Praictique, the Theorique is subdivided into three parts, First, Arithmetick, Secondly, Geometry, and Thirdly, Astrologie. *Vetus nomen est Astrologie qua intelligebant olim Doctrinam, non solum de viribus seu effectibus, verum etiam de motibus Siderum ac corporū Cælestium.*

I suppose you are well versed in the two former parts

parts of the Theorick; therefore in the third part now called Astro-
nomy note these Rules.

First find the Suns place in the Ephemerides and the Zodiacke ob-
liquity, which is equall to the ☉ greatest Declination; and in this
age is about 23 deg. 30 min. and being so prepared, proceed thus.

1 To find the Sunnes Declination, the Rule.

As the reason and proportion of the Radius is to the sine of 23 d.
30 min; So is the sine of the Suns distance from the next Equinocti-
all point, to the sine of the Declination required.

2 To find his right Ascension, the Rule.

As the reason of the Radius is to the Cosine of 23 deg. 30 min. So
is the Tangent of the Suns distance from the next Equinoctiall point;
to the Tangent of the rect-ascension required.

Then find the Longitude and Latitude of any fixed Starre in the
Ephemerides, and againe proceed.

3 To find a Starres right Ascension, the Rule.

As the reason of the Radius, is to the sine of the Starres distance
from the next Equinoctiall point; so is the Cotangent of his Latit.
unto the Tangent of the 4. th Arch; and as the sine of that 4. th. is to
the sine of the Sum or Difference of the same 4 arke, and 23 d. 30 m.
so is the Tangent of his Distance from the next Equinoctiall point,
to the tangent of the rect-ascension required.

4 To find his Declination, the Rule.

As the reason of the Cosine of that 4. th Arke, is to the cosine of
the former 5. th arch, so is the sine of the Starres latitude, to the
sine of his Declination required.

When to take that Sum or Difference making the 4. th Arke, this
is the Rule. If the Longitude and Latitude be both one way, as N.
or South, then take the difference; but if the Longit. be one way,
and the Latitude another way, then take the Summe.

As in this Globe let bac , be the Equator, and de , his Poles: also
 fae , the Elliptique; hi , the Poles; and let d, h , be the North, e, i
the South poles; then is al or an , the Longitude; and k, l or m, n ,
the latitude of a Starre. Therefore we say if the longitude al , and
latitude k, l , be both one way, viz. North subtract; but if the longit.
be an , South; and the latit. m, n , N. then adde according as is requi-
red

The Sea-mans

red in the latter part, Proposition 3; now *ap*. or *aq*. is the right ascension, and *pk* or *qm* the Declination required.

And to prove the truth of the third and fourth Propositions, with like reason, by the rect-ascension and Declination given, we may find the Longitude and Latitude: and this is right necessary; for wise and shilfull men doe affirme and say that when all these are knowne, *viz.* the Longitude, Latitude, Rect-ascension, and Declination of a Starre, then the Starre it selfe is said to be knowne, and not otherwise.

These are the most certaine wayes by which the Starres are knowne, and to these adde thus much: First note their Magnitudes, then their Cullours brightnesse, formes, their twinc kling, their places in the Horizon, Meridian, or passing by the Zenith.

Now let us suppose you are well versed in all the three parts of the Theorique, *viz.* in Arithmetique, Geometry, and Astronomy, all which are to be learned at home and at Schoole: and let us consider what we have to doe at Sea, and how it is well done, after this manner of a learned way though we have little.

Then we propose the Commanders duties, as to find the Distance, and why? with the Reason. To find the Rumbe, and why? with the Reason. To find the Variation of the Compasse, and why? with the Reason. To find the houre of the Day or Night, with the Reason and uses. To find the houre and minute of Conjunction of any two Planets, with the reason and uses. And to find the difference of Longitude by Cœlestiall observation onely.

Then followeth Tables of the Longitude, Latitude, Rect ascension and Declination, of all the fixed Starres of the first and second Magnitude that are yet knowne; Calculated to the first day of January 1640 and Annuall Motion.

The Yonkers duty, is to know the Boates with their furniture; also the Ships Hull, Matts, Yards, Riggings, and Sayles.

There is yet a 4. part belonging as well to the Theorique, as to the Prætique part of Navigation & that is; the Statique Art, the Art of waying well, wherein we consider not onely the Common waights, Tunnage and such like, but also the Sublunary World it selfe, in the knowledge whereof is not the least part of the Mariners care and skill

Alphabet.

9

Skill to be employed, for the safety both of themselves and Ships, with all that is in them.

Therefore, unto the three former parts, and unto his experience, the Sea-man ought to adjoyne this knowledge, the Doctrine whereof is so Divine, having the hand of God alwayes in it; so that our daily Experience teacheth us, that all things within this Sublunary World are in perpetuall Agitation; ever subject to alteration, Corruption and desolution; but this belongeth to the Phisiques, for Meteorologie is a part of Naturall Philosophie.

Lastly, I deliver you here 6 good Lessons, which being thoroughly understood, may make you (by the grace of God) a good Marriner. They may seeme Paradoxes unto some, but you shall hereafter find by their infallible Demonstrations, the undoubted truth of them; therefore I propose them as Theoremes.

Theoreme. 1.

Grammer is not the first Art *In rerum Natura*, but it riseth out of another Art, and into the same it selfe desolveth.

Theo: 2

The Mathematicall Arts and Sciences are profitable and necessary unto Naturall, Morall, Metaphisicall, and Divine knowledge.

Theo: 3

The Magnitude and distances of the Cœlestiall bodies (to the Earth) may be measured and found, by them that will learne the reason.

Theo: 4

The Sunne will come twice to one and the same poynt of the Compass, in one and the same day, yea in an houre, to some Men; namely to those that are wise enough to understand the Reason.

Theo: 5

The difference of Longitude may be found by Cœlestiall observation, every where; by all them that will learne the Reason.